SEQUENCE LISTING

<110> Tahtinen, Marja
Peterson, Part
Krohn, Kai
Ranki, Paivi A.

<120> Self-Replicating Vector for DNA Immunization Against HIV

<130> 227-135 / 2980077US

<140> US 09/622,976
<141> 2000-08-25

<150> PCT/FI99/00152
<151> 1999-02-26

<150> FI 980463
<151> 1998-02-27

<160> 8

<170> PatentIn version 3.1

<210> 1
<211> 621
<212> DNA
<213> Human immunodeficiency virus

B7 cont'd.

<400> 1
atgggtggca agtggtcaaa aagtagtgtg gttggatggc ctactgtaag ggaaagaatg 60

agacgagctg agccagcagc agatggggtg ggagcagcat ctcgagacct ggaaaaacat 120

ggagcaatca caagtagcaa tacagcagct accaatgctg cttgtgcctg gctagaagca 180

caagaggagg aggaggtggg ttttccagtc acacctcagg tacctttaag accaatgact 240

tacaaggcag ctgtagatct tagccacttt ttaaaagaaa aggggggact ggaagggcta 300

attcactccc aacgaagaca agatatcctt gatctgtgga tctaccacac acaaggctac 360

ttccctgatt ggcagaacta cacaccaggg ccaggggtca gatatccact gacctttgga 420

tggtgctaca agctagtacc agttgagcca gataaggtag aagaggccaa taaaggagag 480

aacaccagct tgttacaccc tgtgagcctg catggaatgg atgaccctga gagagaagtg 540

ttagagtgga ggtttgacag ccgcctagca tttcatcacg tggcccgaga gctgcatccg 600

gagtacttca agaactgctg a 621

<210> 2
<211> 351
<212> DNA
<213> Human immunodeficiency virus

<400> 2
atggcaggaa gaagcggaga cagcgacgaa gacctcctca aggcagtcag actcatcaag 60

tttctctatc aaagcaaccc acctcccaac cccgagggga cccgacaggc ccgaaggaat 120

agaagaagaa ggtggagaga gagacagaga cagatccatt cgattagtga acggatcctt 180

agcacttatc tgggacgatc tgcggagcct gtgcctcttc agctaccacc gcttgagaga 240

cttactcttg attgtaacga ggattgtgga acttctggga cgcaggggggt gggaagccct 300

caaatattgg tggaatctcc tacagtattg gagtcaggaa ctaaagaata g 351

<210> 3
<211> 261
<212> DNA
<213> Human immunodeficiency virus

<400> 3
atggagccag tagatcctag actagagccc tggaagcatc caggaagtca gcctaaaact 60

gcttgtacca cttgctattg taaaaagtgt tgctttcatt gccaagtttg tttcacaaca 120

aaagccttag gcatctccta tggcaggaag aagcggagac agcgacgaag acctcctcaa 180

ggcagtcaga ctcatcaagt ttctctatca aagcaaccca cctcccaacc ccgaggggac 240

ccgacaggcc cgaaggaata g 261

<210> 4
<211> 9229
<212> DNA
<213> Human immunodeficiency virus

<400> 4
ggtctctctg gttagaccag atttgagcct gggagctctc tggctaacta gggaacccac 60

tgcttaagcc tcaataaagc ttgccttgag tgcttcaagt agtgtgtgcc cgtctgttgt 120

gtgactctgg taactagaga tccctcagac ccttttagtc agtgtggaaa atctctagca 180

gtggcgcccg aacagggact tgaaagcgaa agggaaacca gaggagctct ctcgacgcag 240

gactcggctt gctgaagcgc gcacggcaag aggcgagggg aggcgactgg tgagtacgcc 300

aaaaattttg actagcggag gctagaagga gagagatggg tgcgagagcg tcagtattaa 360

gcgggggaga attagatcga tgggaaaaaa ttcggttaag gccaggggga aagaaaaaat 420

ataaattaaa acatatagta tgggcaagca gggagctaga acgattcgca gttaatcctg 480

gcctgttaga aacatcagaa ggctgtagac aaatactggg acagctacaa ccatcccttc 540

agacaggatc agaagaactt agatcattat ataatacagt agcaaccctc tattgtgtgc 600

atcaaaggat agagataaaa gacaccaagg aagctttaga caagatagag gaagagcaaa 660

acaaaagtaa gaaaaaagca cagcaagcag cagctgacac aggacacagc agccaggtca 720

gccaaaatta ccctatagtg cagaacatcc aggggcaaat ggtacatcag gccatatcac 780

ctagaacttt aaatgcatgg gtaaaagtag tagaagagaa ggctttcagc ccagaagtga 840

tacccatgtt ttcagcatta tcagaaggag ccaccccaca agatttaaac accatgctaa 900

acacagtggg gggacatcaa gcagccatgc aaatgttaaa agagaccatc aatgaggaag 960

ctgcagaatg ggatagagtg catccagtgc atgcagggcc tattgcacca ggccagatga 1020

gagaaccaag gggaagtgac atagcaggaa ctactagtac ccttcaggaa caaataggat 1080

ggatgacaaa taatccacct atcccagtag gagaaattta taaaagatgg ataatcctgg 1140

gattaaataa aatagtaaga atgtatagcc ctaccagcat tctggacata agacaaggac 1200

caaaagaacc ctttagagac tatgtagacc ggttctataa aactctaaga gccgagcaag 1260

cttcacagga ggtaaaaaat tggatgacag aaaccttgtt ggtccaaaat gcgaacccag 1320

attgtaagac tattttaaaa gcattgggac cagcagctac actagaagaa atgatgacag 1380

catgtcaggg agtgggagga cccggccata aggcaagagt tttggctgaa gcaatgagcc 1440

aagtaacaaa ttcagctacc ataatgatgc aaagaggcaa ttttaggaac caaagaaaga 1500

B7 ttgttaagtg tttcaattgt ggcaaagaag ggcacatagc cagaaattgc agggccccta 1560

ggaaaaaggg ctgttggaaa tgtggaaagg aaggacacca aatgaaagat tgtactgaga 1620

gacaggctaa ttttttaggg aagatctggc cttcctacaa gggaaggcca gggaattttc 1680

ttcagagcag accagagcca acagccccac catttcttca gagcagacca gagccaacag 1740

ccccaccaga agagagcttc aggtctgggg tagagacaac aactccctct cagaagcagg 1800

agccgataga caaggaactg tatcctttaa cttccctcag atcactcttt ggcaacgacc 1860

cctcgtcaca ataaagatag gggggcaact aaaggaagct ctattagata caggagcaga 1920

tgatacagta ttagaagaaa tgagtttgcc aggaagatgg aaaccaaaaa tgatagggggg 1980

aattggaggt tttatcaaag taagacagta tgatcagata ctcatagaaa tctgtggaca 2040

taaagctata ggtacagtat tagtaggacc tacacctgtc aacataattg gaagaaatct 2100

gttgactcag attggttgca ctttaaattt tcccattagt cctattgaaa ctgtaccagt 2160

aaaattaaag ccaggaatgg atggcccaaa agttaaacaa tggccattga cagaagaaaa 2220

aataaaagca ttagtagaaa tttgtacaga aatggaaaag gaagggaaaa tttcaaaaat 2280

tgggcctgaa aatccataca atactccagt atttgccata aagaaaaaag acagtactaa 2340

atggagaaaa ttagtagatt tcagagaact taataagaga actcaagact tctgggaagt 2400

tcaattagga ataccacatc ccgcagggtt aaaaaagaaa aaatcagtaa cagtactgga 2460

tgtgggtgat gcatattttt cagttccctt agatgaagac ttcaggaagt atactgcatt 2520

taccatacct agtataaaca atgagacacc agggattaga tatcagtaca atgtgcttcc 2580

acagggatgg aaaggatcac cagcaatatt ccaaagtagc atgacaaaaa tcttagagcc 2640

ttttagaaaa caaaatccag acatagttat ctatcaatac atggatgatt tgtatgtagg 2700

atctgactta gaaatagggc agcatagaac aaaaatagag gagctgagac aacatctgtt 2760

gaggtgggga cttaccacac cagacaaaaa acatcagaaa gaacctccat tcctttggat 2820

gggttatgaa ctccatcctg ataaatggac agtacagcct atagtgctgc cagaaaaaga 2880

cagctggact gtcaatgaca tacagaagtt agtgggaaaa ttgaattggg caagtcagat 2940

ttacccaggg attaaagtaa ggcaattatg taaactcctt agaggaacca aagcactaac 3000

agaagtaata ccactaacag aagaagcaga gctagaactg gcagaaaaca gagagattct 3060

aaaagaacca gtacatggag tgtattatga cccatcaaaa gacttaatag cagaaataca 3120

gaagcagggg caaggccaat ggacatatca aatttatcaa gagccattta aaaatctgaa 3180

B7 aacaggaaaa tatgcaagaa cgaggggtgc ccacactaat gatgtaaaac aattaacaga 3240

ggcagtgcaa aaaataacca cagaaagcat agtaatatgg ggaaagactc ctaaatttaa 3300

actacccata caaaaggaaa catgggaaac atggtggaca gagtattggc aagccacctg 3360

gattcctgag tgggagtttg tcaatacccc tcctttagtg aaattatggt accagttaga 3420

gaaagaaccc atagtaggag cagaaacgtt ctatgtagat ggggcagcta gcagggagac 3480

taaattagga aaagcaggat atgttactaa tagaggaaga caaaaagttg tcaccctaac 3540

tgacacaaca aatcagaaga ctgagttaca agcaattcat ctagctttgc aggattcggg 3600

attagaagta aatatagtaa cagactcaca atatgcatta ggaatcattc aagcacaacc 3660

agataaaagt gaatcagagt tagtcaatca aataatagag cagttaataa aaaaggaaaa 3720

ggtctatctg gcatgggtac agcacacaa aggaattgga ggaaatgaac aagtagataa 3780

attagtcagt gctggaatca ggaaagtact atttttagat ggaatagata aggcccaaga 3840

tgaacatgag aaatatcaca gtaattggag agcaatggct agtgatttta acctgccacc 3900

tgtagtagca aaagaaatag tagccagctg tgataaatgt cagctaaaag gagaagccat 3960

gcatggacaa gtagactgta gtccaggaat atggcaacta gattgtacac atttagaagg 4020

aaaagttatc ctggtagcag ttcatgtagc cagtggatat atagaagcag aagttattcc 4080

agcagaaaca gggcaggaaa cagcatactt tcttttaaaa ttagcaggaa gatggccagt 4140

aaaaacaata catacagaca atggcagcaa tttcaccagt actacggtta aggccgcctg 4200

ttggtgggcg ggaatcaagc aggaatttgg aattccctac aatccccaaa gtcaaggagt 4260

agtagaatct atgaataaag aattaaagaa aattataggc caggtaagag atcaggctga 4320

acatcttaag acagcagtac aaatggcagt attcatccac aattttaaaa gaaaaggggg 4380

gattgggggg tacagtgcag gggaaagaat agtagacata atagcaacag acatacaaac 4440

taaagaatta caaaaacaaa ttacaaaaat tcaaaatttt cgggtttatt acagggacag 4500

cagagatcca ctttggaaag gaccagcaaa gctcctctgg aaaggtgaag gggcagtagt 4560

aatacaagat aatagtgaca taaaagtagt gccaagaaga aaagcaaaga tcattaggga 4620

ttatggaaaa cagatggcag gtgatgattg tgtggcaagt agacaggatg aggattagaa 4680

catggaaaag tttagtaaaa caccatatgt atgtttcagg gaaagctagg ggatggtttt 4740

atagacatca ctatgaaagc cctcatccaa gaataagttc agaagtacac atcccactag 4800

gggatgctag attggtaata acaacatatt ggggtctgca tacaggagaa agagactggc 4860

atctgggtca gggagtctcc atagaatgga ggaaaaagag atatagcaca caagtagacc 4920

B7 ctgaactagc agaccaacta attcatctgt attactttga ctgtttttca gactctgcta 4980

taagaaaggc cttattagga catatagtta gccctaggtg tgaatatcaa gcaggacata 5040

acaaggtagg atctctacaa tacttggcac tagcagcatt aataacacca aaaaagataa 5100

agccaccttt gcctagtgtt acgaaactga cagaggatag atggaacaag ccccagaaga 5160

ccaagggcca cagagggagc cacacaatga atggacacta gagcttttag aggagcttaa 5220

gaatgaagct gttagacatt ttcctaggat ttggctccat ggcttagggc aacatatcta 5280

tgaaacttat ggggatactt gggcaggagt ggaagccata ataagaattc tgcaacaact 5340

gctgtttatc catttcagaa ttgggtgtcg acatagcaga taggcgtta ctcaacagag 5400

gagagcaaga aatggagcca gtagatccta gactagagcc ctggaagcat ccaggaagtc 5460

agcctaaaac tgcttgtacc acttgctatt gtaaaaagtg ttgctttcat tgccaagttt 5520

gtttcacaac aaaagcctta ggcatctcct atggcaggaa gaagcggaga cagcgacgaa 5580

gacctcctca aggcagtcag actcatcaag tttctctatc aaagcagtaa gtagtacatg 5640

taatgcaacc tatacaaata gcaatagcag cattagtagt agcaataata atagcaatag 5700

ttgtgtggtc catagtaatc atagaatata ggaaaatatt aagacaaaga aaaatagaca 5760

ggttaattga tagactaata gaaagagcag aagacagtgg caatgagagt gaaggagaaa 5820

tatcagcact tgtggagatg ggggtggaaa tggggcacca tgctccttgg gatattgatg 5880

atctgtagtg ctacagaaaa attgtgggtc acagtctatt atggggtacc tgtgtggaag 5940

gaagcaacca ccactctatt ttgtgcatca gatgctaaag catatgatac agaggtacat 6000

aatgtttggg ccacacatgc ctgtgtaccc acagacccca acccacaaga agtagtattg 6060

gtaaatgtga cagaaaattt taacatgtgg aaaaatgaca tggtagaaca gatgcatgag 6120

gatataatca gtttatggga tcaaagccta aagccatgtg taaaattaac cccactctgt 6180

gttagtttaa agtgcactga tttggggaat gctactaata ccaatagtag taataccaat 6240

agtagtagcg gggaaatgat gatggagaaa ggagagataa aaaactgctc tttcaatatc 6300

agcacaagca taagaggtaa ggtgcagaaa gaatatgcat ttttttataa acttgatata 6360

ataccaatag ataatgatac taccagctat acgttgacaa gttgtaacac ctcagtcatt 6420

acacaggcct gtccaaaggt atcctttgag ccaattccca tacattattg tgccccggct 6480

ggttttgcga ttctaaaatg taataataag acgttcaatg gaacaggacc atgtacaaat 6540

gtcagcacag tacaatgtac acatggaatt aggccagtag tatcaactca actgctgttg 6600

B9 aatggcagtc tagcagaaga agaggtagta attagatctg ccaatttcac agacaatgct 6660

aaaaccataa tagtacagct gaaccaatct gtagaaatta attgtacaag acccaacaac 6720

aatacaagaa aaagtatccg tatccagagg ggaccaggga gagcatttgt tacaatagga 6780

aaaataggaa atatgagaca agcacattgt aacattagta gagcaaaatg gaatgccact 6840

ttaaaacaga tagctagcaa attaagagaa caatttggaa ataataaaac aataatcttt 6900

aagcaatcct caggagggga cccagaaatt gtaacgcaca gttttaattg tggaggggaa 6960

tttttctact gtaattcaac acaactgttt aatagtactt ggtttaatag tacttggagt 7020

actgaagggt caaataacac tgaaggaagt gacacaatca cactcccatg cagaataaaa 7080

caatttataa acatgtggca ggaagtagga aaagcaatgt atgcccctcc catcagcgga 7140

caaattagat gttcatcaaa tattacaggg ctgctattaa caagagatgg tggtaataac 7200

aacaatgggt ccgagatctt cagacctgga ggaggagata tgagggacaa ttggagaagt 7260

gaattatata aatataaagt agtaaaaatt gaaccattag gagtagcacc caccaaggca 7320

aagagaagag tggtgcagag agaaaaaaga gcagtgggaa taggagcttt gttccttggg 7380

ttcttgggag cagcaggaag cactatgggc gcacggtcaa tgacgctgac ggtacaggcc 7440

agacaattat tgtctggtat agtgcagcag cagaacaatt tgctgagggc tattgaggcg 7500

caacagcatc tgttgcaact cacagtctgg ggcatcaagc agctccaggc aagaatcctg 7560

gctgtggaaa gatacctaaa ggatcaacag ctcctgggga tttggggttg ctctggaaaa 7620

ctcatttgca ccactgctgt gccttggaat gctagttgga gtaataaatc tctggaacag 7680

atttggaata acatgacctg gatggagtgg gacagagaaa ttaacaatta cacaagctta 7740

atacattcct taattgaaga atcgcaaaac cagcaagaaa agaatgaaca agaattattg 7800

gaattagata aatgggcaag tttgtggaat tggtttaaca taacaaattg gctgtggtat 7860

ataaaaatat tcataatgat agtaggaggc ttggtaggtt taagaatagt ttttgctgta 7920

ctttctatag tgaatagagt taggcaggga tattcaccat tatcgtttca gacccacctc 7980

ccaaccccga ggggacccga caggcccgaa ggaatagaag aagaaggtgg agagagagac 8040

agagacagat ccattcgatt agtgaacgga tccttagcac ttatctggga cgatctgcgg 8100

agcctgtgcc tcttcagcta ccaccgcttg agagacttac tcttgattgt aacgaggatt 8160

gtggaacttc tgggacgcag ggggtgggaa gccctcaaat attggtggaa tctcctacag 8220

tattggagtc aggaactaaa gaatagtgct gttagcttgc tcaatgccac agccatagca 8280

gtagctgagg ggacagatag ggttatagaa gtagtacaag gagcttgtag agctattcgc 8340

B7 cacataccta gaagaataag acagggcttg gaaaggattt tgctataaga tgggtggcaa 8400

gtggtcaaaa agtagtgtgg ttggatggcc tactgtaagg gaaagaatga gacgagctga 8460

gccagcagca gatggggtgg gagcagcatc tcgagacctg gaaaaacatg gagcaatcac 8520

aagtagcaat acagcagcta ccaatgctgc ttgtgcctgg ctagaagcac aagaggagga 8580

ggaggtgggt tttccagtca cacctcaggt acctttaaga ccaatgactt acaaggcagc 8640

tgtagatctt agccactttt taaaagaaaa ggggggactg gaagggctaa ttcactccca 8700

acgaagacaa gatatccttg atctgtggat ctaccacaca caaggctact tccctgattg 8760

gcagaactac acaccagggc caggggtcag atatccactg acctttggat ggtgctacaa 8820

gctagtacca gttgagccag ataaggtaga agaggccaat aaaggagaga acaccagctt 8880

gttacaccct gtgagcctgc atggaatgga tgaccctgag agagaagtgt tagagtggag 8940

gtttgacagc cgcctagcat ttcatcacgt ggcccgagag ctgcatccgg agtacttcaa 9000

gaactgctga catcgagctt gctacaaggg actttccgct ggggactttc cagggaggcg 9060

tggcctgggc gggactgggg agtggcgagc cctcagatgc tgcatataag cagctgcttt 9120

ttgcctgtac tgggtctctc tggttagacc agatttgagc ctgggagctc tctggctaac 9180

tagggaaccc actgcttaag cctcaataaa gcttgccttg agtgcttca 9229

<210> 5
<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 5
tttttctaga accatggcag gaagaagcgg a 31

<210> 6
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 6
ttttctcgag ctattcttta gttcctgg 28

B7 concld.

<210> 7
<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 7
tttttctaga accatggagc cagtagatcc t 31

<210> 8
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 8
ttttctcgag ctaatcgaac ggatctgc 28